
APPENDIX A: QUAL2E WINDOWS INTERFACE DESIGN

This appendix contains the structures and variables for the QUAL2E Windows interface. Table A.1 provides input variables and the screen sequence in QUAL2E. There are a total of 24 screens in the QUAL2E interface. The input screen sequence (see Table 3.1) reflects the overall structure of the QUAL2E model. Screen numbers are assigned to cover all the general input requirements discussed previously. Table A.1 identifies the variables for each screen. This table contains the following for QUAL2E:

1. Input code used in QUAL2E
2. Data type
3. Description of the variable
4. QUAL2E variable
5. Screen number (SCR No.)
6. Control number (CON No.)
7. Control type (CON Type)
8. Item, type, range, default, and unit

Input code and data type are used in the uncertainty analysis part of QUAL2E. They are listed here for proper cross-referencing of the variables. Refer to Appendix B of *The Enhanced Stream Water Quality Models QUAL2E and QUAL2E-UNCAS: Documentation and User Manual* for more details. Screen number, control number, and control types are used internally by the QUAL2E Windows interface. Each variable has a unique control number on a particular screen in the interface. For example, if you refer to the first page of Table A.1, a variable NUMB is defined as Number of reaches, which is the last control on the first screen. In the QUAL2E###.RUN file it is the 10th card of Data Type 1; i.e., if you were to prepare an input file (QUAL2E###.RUN) without using the interface, you would enter Number of reaches in the 10th row of the group named Data Type 1. The NUMB's type is integer, its range is from 1 to 50, and the default should be 1. These data are used by the QUAL2E model.

A total of five input files may be needed for a QUAL2E run. Refer to Section 5.2 to see which files are required and which are optional.

Table A.1 Input Variables and Screen Sequence in QUAL2E

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
		QUAL2E Simulation									
		Description of this run	TITLE01,02	1	1	1		C160			
	1	Simulation Type	STEA	1	2	5					
		Steady-state		1	3	6					
		Dynamic		1	4	6					
	1	Unit	INPU	1	5	5					
		U.S. units		1	6	6					
		Metric		1	7	6					
		Uncertainty analysis		1	8	4					
	1	Flow augmentation	FIOW	1	9	4					
	1	Trapezoidal channels	TRAP	1	10	4					
	1	Max. Iterations	MAXI	1	11	1			1-	30	
	1	Time step (hours)	TIME	1	12	1		F	0-	0.0	
	1	Starting day of simulation	STAN	1	13	1		I	1-366	180	
	1	Total simulation length (hours)	MAXI	1	14	1		F		0.0	
	1	Time increment for RPT2 (hours)		1	15	1		F	0-	0.0	
		Stream system		1		5					
	1	Number of reaches	NUMB	1	16	1		I	1-50	1.0	
		*** Array screen, 1(16) determines # of rows									
		Stream Reach System									
	2	REACH NO.		2	1	1		I	0-50		
	2	REACH NAME		2	2	1		C15			
	2	BEGIN RIVER \n (mile) or (km)		2	3	1		F	0-	0.0	mile,km
	2	END RIVER \n (mile) or (km)		2	4	1		F	0-	0.0	mile,km
		HEADWATER		2	5	4					
	1	DELTA-X \n(mile) or (km)		2	6	1		F		1.0	
		*** Array screen, 1(16) determines # of rows									
		*** shrink column width, 5(4-22) has the same combolist									
		Computational Element									
	4	REACH NO.		3	1	?		I			
	4	TOTAL \nELE		3	2	?/cal		I	2-20		
	4	1		3	3	3		C4			
		Headwater		3				1	1		
		Standard		3				2	2		
		Junction		3				3	4		
		Point source		3				4	6		
		Withdrawal		3				5	7		
		Dam		3				6	2		
	4	2		3	4	3		C4			

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
		Standard		3			1		2		
		U/S junction		3			2		3		
		Downstream		3			3		5		
		Point source		3			4		6		
		Withdrawal		3			5		7		
		Dam		3			6		2		
	4	3		3	5	3		C4			
	4	4		3	6	3		C4			
	4	5		3	7	3		C4			
	4	6		3	8	3		C4			
	4	...		3	...			C4			
	4	20		3	22	3		C4			
		Water Quality Simulation									
		Temperature	TITLE06	4	1	4					
		BOD	TITLE07	4	2	4					
		Algae	TITLE08	4	3	4					
		Phosphorus cycle	TITLE09,10	4	4	4					
		Nitrogen cycle	TITLE11,12	4	5	4					
		Dissolved Oxygen	TITLE13	4	6	4					
		Fecal coliform	TITLE14	4	7	4					
		Conservative constituent		4	8	4					
		Number of constituents		4	9	1		I	0-3		
		Constituent #1	TITLE03	4	10	1		C4			
		Unit		4	11	1		C4			
		Constituent #2	TITLE04	4	12	1		C4			
		Unit		4	13	1		C4			
		Constituent #3	TITLE05	4	14	1		C4			
		Unit		4	15	1		C4			
		Non-conservative	TITLE015	4	16	4					
		Constituent name		4	17	1		C4			
		Unit		4	18	1		C4			
	1	Specified d/s boundary constituent concentrations	FIXE	4	19	4					
		BOD5		4	20	4					
	1	5-day ultimate BOD conversion K coeff.		4	21	1		F		0.23	
		Geographical and Climatological Data									
	1	Latitude (deg)	LATI	5	1	1		F10.0	0-90	34	DEG
	1	Longitude (dge)		5	2	1		F10.0	0-180	85	DEG
	1	Standard meridian (deg)	STAN	5	3	1		F10.0	0-180	75	DEG

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
	1	Basin Elevation (ft)	ELEV	5	4	1		F	- 4 0 0 - 12000	1000	ft
	1	Dust attenuation coeff		5	5	1		F	0 . 0 5 - 0.15	0.06	
	1	Evaporation coeff		5		5					
ECOEF-AE	1	AE		5	6	1		F	0.0006-0.0068	0.00103	(ft/hr)/(in-Hg)
				5				F	0.000005-	0.0000094	(m/hr)/mbar
				5					0.000062		
ECOEF-BE	1	BE		5	7	1		F	0.00016-	0.00016	(ft/hr)/(in-Hg - mph)
				5				F	0.000272		
				5				F	0.0000032-	0.0000032	(m/hr)/mbar - m/s
				5				F	0.0000055		
		Temp correction factors		5	8	5					
		Default		5	9	6					
		User specified		5	10	6					
		Climatological data		5	11	5					
		Reach variable temp		5	12	6					
		Global values		5	13	6					
		Climatological input file		5	14	3					
		Output print		5		5					
	1	Summary	WRIT	5	15	4					
	1	Climatological data printout	PRIN	5	16	4					
	1	DO and BOD plot	PLOT	5	17	4					
		# of DO/BOD plots		5	18	1			1-50		
		Observed Dissolved Oxygen input file		5	19	3		C12			
		*** list all the reach numbers									
		*** 7(18) determines # of rows & 1(16)+1 determines # of columns									
		Reach Numbers for DO/BOD to be Plotted									
		PLOT		6	1	7		I	0-50		
		#LOC		6	2	1		I			
		R1		6	3	4					
		R2		6	4	4					
		R3		6	5	4					
		...		6	...	4					

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
		R50		6	52	4					
		*** Array screen, load values from 5(18) if DO input file is available	file is available								
		*** or create Observed DO input file									
		Observed Dissolved Oxygen Data									
		PLOT		7	1	3		I			
		RIVER LOCATION \n (mile) or (km)		7	2	1		F			mile,km
		MIN DO \n (mg/l)		7	3	1		F	0.0-25.0	0.0	mg/l
		AVE DO \n (mg/l)		7	4	1		F	0.0-25.0	0.0	mg/l
		MAX DO \n (mg/l)		7	5	1		F	0.0-25.0	0.0	mg/l
		*** Required only algae, N, or P are simulated									
		Global Kinetics									
		Oxygen uptake by		8		5					
NH3OXYUP	1A	Ammonia oxidation (mg O/mg N)	O_UP	8	1	1		F	3-3.5	3.43	m g O/mg N
NO2OXYUP	1A	Nitrite oxidation (mg O/mg N)		8	2	1		F	1-1.2	1.14	m g O/mg N
	1A	Algae		8		5					
AGYOXYPR	1A	Oxygen production by growth (mg O/mg A)	O_PR	8	3	1		F	1.4-1.8	1.6	m g O/mg A
AGYOXYUP	1A	Oxygen uptake by respiration (mg O/mg A)			8	4	1	F	1.6-2.3	2.0	mg O/mg A
AGYNCON	1A	Nitrogen content (mg N/mg A)	N_CO	8	5	1		F	0.08 - 0.09	0.085	m g N/mg A
AGYPCON	1A	Phosphorus content (mg P/mg A)		8	6	1		F	0.012 - 0.015	0.014	m g P/mg A
AGYGRMX	1A	Max. specific growth rate (1/day)	ALG_	8	7	1		F	1-3.	2.5	
AGYRESPR	1A	Respiration rate (1/day)		8	8	1		F	0.05-0.5	0.05	
NHALFSAT	1A	Nitrogen half saturation coeff	N_HA	8	9	1		F	0.02-0.4	0.2	
PHALFSAT	1A	Phosphorus half saturation coeff		8	10	1		F	0.02-0.1	0.04	
AGYEXTLN	1A	Linear coeff.	LIN_	8	11	1		F	0-0.003	0.0007	(1/ft)/(u g-chal/l)
AGYEXTNL	1A	Nonlinear coeff.		8	12	1		F	0-0.003	0.0	(1/m)/(u g-chal/l)
		Light		8		5					
	1A	Light Function	LIGH	8	13	3		I	1-3	1	
	1A	Half saturation		8				1			

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
	1A	Simth's function		8			2				
	1A	Steele's function		8			3				
	1A	Saturation coeff.		8	14	1		F	0-0.15	0.11	BTU/ft ² -min
				8					0-0.04	0.03	Langley/min
	1A	Intensity		8	15	1		F	0-1500	1300	BTU/ft ² -min
				8					0-400.0	350.0	Langley/min
	1A	Light ave. from sloar radiation		8	16	3		I	1-4	2	
	1A	Daily-temp	DAIL	8			1				
	1A	Daily-data		8			2				
	1A	24 hourly-temp		8			3				
	1A	24 hourly-data		8			4				
LAVG FACT	1A	Light averaging factor		8	17	1		F	0.85-1.0	0.92	
NUMB DLH	1A	Number of daylight hours	NUMB	8	18	1		F	4.-18.0	14.0	
TDYS OLAR	1A	Daily radiation (BTU/ft ²) or (Langleys)		8	19	1		F	0.-1500.	1300.0	BTU/ft ² ,Langleys
	1A	Light nutrient interactions		8	20	3		I	1-3	2	
	1A	Multiplicative	ALGY	8			1				
	1A	Limiting nutrient		8			2				
	1A	Harmoni mean		8			3				
APRE FNH3	1A	Algal preference factor for NH3		8	21	1		F	0.1-0.9	0.9	
A/TFA CT	1A	Solar radiation factor	ALG/	8	22	1		F	0.4-0.5	0.44	
NHIBF ACT	1A	Nitrification inhibition coeff.		8	23	1		F	0.-10.0	10.0	
		Temperature Correction Factors									
TC/BO DDC	1B	BOD decay		9	1	1		F	1-1.1	1.047	
TC/BO DST	1B	BOD settling		9	2	1		F	1-1.1	1.024	
TC/BE AER	1B	Reaeration		9	3	1		F	1-1.1	1.024	
TC/SO D	1B	SOD uptake		9	4	1		F	1-1.1	1.060	
		Nitrogen		9		5					
TC/NH 2DC	1B	Organic N decay		9	5	1		F	1-1.1	1.047	
TC/NH 2ST	1B	Organic N settling		9	6	1		F	1-1.1	1.024	

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
TC/NH 2ST	1B	Ammonia decay		9	7	1		F	1-1.1	1.083	
TC/NH 3SC	1B	Ammonia source		9	8	1		F	1-1.1	1.074	
TC/NO 2DC	1B	Nitrite decay		9	9	1		F	1-1.1	1.047	
		Phosphorus		9		5					
TC/PR GDC	1B	Organic P decay		9	10	1		F	1-1.1	1.047	
TC/PR GST	1B	Organic P settling		9	11	1		F	1-1.1	1.024	
TC/PO 4SC	1B	Dissolved P source		9	12	1		F	1-1.1	1.074	
		Algae		9		5					
TC/AL GRO	1B	Growth		9	13	1		F	1-1.1	1.047	
TC/AL RES	1B	Respiration		9	14	1		F	1-1.1	1.047	
TC/AL SET	1B	Settling		9	15	1		F	1-1.1	1.024	
TC/CL ID	1B	Coliform decay		9	16	1		F	1-1.1	1.047	
		Non-conservative		9		5					
TC/AN CDC	1B	Decay		9	17	1		F	1-1.1	1.000	
TC/AN CST	1B	Settling		9	18	1		F	1-1.1	1.024	
TC/AN CSC	1B	Source		9	19	1		F	1-1.1	1.000	
		*** Array screen, 1(16) determines # of rows									
		*** Load all headwaters into a comb-list for 12(4-9)									
		Flow Augmentation									
		REACH NO.			10	1	?				
	3	# OF HEAD			10	2	1	I	0-100	0	
	3	MIN DO \n(mg/l)			10	3	1	F	0.-15.	5.0	mg/l
	3	SOURCE /#1			10	4	3		0-100	0	
	3	SOURCE /#2			10	5	3		0-100	0	
	3	SOURCE /#3			10	6	3		0-100	0	
	3	SOURCE /#4			10	7	3		0-100	0	
	3	SOURCE /#5			10	8	3		0-100	0	
	3	SOURCE /#6			10	9	3		0-100	0	
		*** Array screen, 1(16) determines # of rows									
		Hydraulic Data									
	5	REACH NO.			11	1	1	I	1-50		

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
DISPS N-K	5	DISPER \nCONST		11	2	1		F	6.-6000.	60.0	ft ² /s,m 2/day
COEF QV-A	5	Q COEFF \nVELOCITY		11	3	1		F	0.-	0.0	
EXPO QV-B	5	Q EXP \nVELOCITY		11	4	1		F	0.0-1.0	0.00	
COEF QH-C	5	Q COEFF \n DEPTH		11	5	1		F	0-	0.00	
EXPO QH-D	5	Q EXP \nDEPTH		11	6	1		F	0.0-1.0	0.00	
MANN INGS	5	MANNING		11	7	1		F	.001-.05	0.02	
TRAP- SS1	5	SIDE \nSLOPE 1		11	8	1		F	0 . 0 - 1000.		ft/ft,m/ m
TRAP- SS2	5	SIDE \n SLOPE 2		11	9	1		F	0 . 0 - 1000.		ft/ft,m/ m
TRAP- WTH	5	WIDTH		11	10	1		F	0-		ft,m
TRAP- SLP	5	SLOPE		11	11	1		F	0.0-1.0		ft/ft,m/ m
ELEV ATIN	5A	ELEV		11	12	1		F	- 4 0 0 - 12000	1000.0	ft
									- 1 2 0 . - 3650.	305	m
DUST ATTN	5A	DUST /COEFF		11	13	1		F	.01-.15	.06	
CLOU D	5A	CLOUD		11	14	1		F	0.0-1.0	0.0	
DRYB ULB	5A	DRY /TEMP		11	15	1		F	1.-100.	70.	F
									2-55	20	C
WETB ULB	5A	WET /TEMP		11	16	1		F	1.-100.	60.	F
									2.-55.	15.0	C
ATMP RES	5A	BAROMETRIC /PRESSURE		11	17	1		F	27.-33.	30.	in-Hg
									9 0 0 . - 1100.	1017.	mbar
WIND VEL	5A	WIND /SPEED		11	18	1		F	0.-100.	0.0	ft/s
									0-36	0.0	m/s
		*** Array screen, 1(16) determines # of rows									
		BOD and DO Reaction Rate Constants									
		REACH NO.		12	1	?					
B O D DECA	6	BOD DECAY \n(1/day)		12	2	1		F	0.-10.	0.0	1/day

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
B O D SETT	6	BOD SETTLING \n(1/day)		12	3	1		F	0.-10.	0.0	1/day
S O D RATE	6	SOD RATE \n(g/ft2-day) or (f/m2-day)		12	4	1		F	0.-1.	0.0	g / f t 2 - day,
								F	0.-10.	0.0	g / m 2 - day
	6	TYPE \n REAERATION		12	5	3		I	1-8	3	
	6	Single coeff.		12			1				
	6	Churchill		12			2				
	6	O'Connor and Dobbins		12			3				
	6	Owens, Edwards, and Gibbs		12			4				
	6	Thackston and Krenkel		12			5				
	6	Langbien and Durum		12			6				
	6	Power function		12			7				
	6	Tsivoglou-Wallace		12			8				
	6	REAERATION \n COEFF.		12	6	1		F	0.-100.	0.0	
	6	COEFF		12	7	1		F	0-	0.0	1/ft,1/m
	6	EXPONENT		12	8	1		F	0-	0.0	
		*** Array screen, 1(16) determines # of rows									
		N, P, and Algae Coefficients				1					
	6A	REACH NO.		13	1	?					
N H 2 DECA	6A	O-N \n HYDROLYSIS		13	2	1		F	0.-10.	0.0	1/day
N H 2 SETT	6A	O-N \n SETTLING		13	3	1		F	0.-10.	0.0	1/day
N H 3 DECA	6A	NH3 \n OXIDATION		13	4	1		F	0.-10.	0.0	1/day
N H 3 SRCE	6A	NH3 \n BENTHOS		13	5	1		F	0-	0.0	mg/ft2-day
										0.0	mg/m2-day
N O 2 DECA	6A	NO2 \n OXIDATION		13	6	1		F	0.-10.	2.0	1/day
PORG DEC	6A	O-P \n DECAY		13	7	1		F	0.-10.	0.0	1/day
PORG SET	6A	O-P \n SETTLING		13	8	1		F	0-	0.0	1/day
D I S P SRC	6A	DIS-P \n BENTHOS		13	9	1		F	0-	0.0	mg/ft2-day
										0.0	mg/m2-day
CHLA/ART	6B	CHL-A \n ALGAE		13	10	1		F	1.-100.	10.0	u g chla/mg algae
A L G SETT	6B	ALGAE \n SETTLING		13	11	1		F	0.-3.	1.0	ft/day

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
				13					0-1.0	1.0	m/day
L T E X T N C O	6B	NON-ALGAL \n LIGHT EXT		13	12	1		F	0-3	0.0	1/ft
				13					0-24.0	0	1/m
C O L I D E C	6B	COLIFORM		13	13	1		F	0.-10.	0.0	1/day
				13							
A N C D E C A	6B	NON-CONS \n DECA Y		13	14	1		F	0-	0.0	1/day
A N C S E T T	6B	NON-CONS \n S E T T L I N G		13	15	1		F	0-	0.0	1/day
A N C S R C E	6B	NON-CONS \n B E N T H O S		13	16	1		F	0-	0.0	mg/ft2-day
									0-	0.0	mg/m2-day
		*** Array screen, 1(16) determines # of rows									
		*** 'name' is obtained from Screen No. 6 if any									
		Initial Conditions of the Stream									
	7	REACH NO.		14	1	?			1-50	1	
	7	TEMP		14	2	1		F	35.-135.	70.0	F
									2-55.0	21.0	C
	7	DO		14	3	1		F	0.-15.	0.0	mg/l
	7	BOD		14	4	1		F	0.-1000.	0.0	mg/l
	7	CONS #1\nname		14	5	?/1		F	0-		f r o m 6(11)
	7	CONS #2 \nname		14	6	?/1		F	0-		f r o m 6(13)
	7	CONS #3\nname		14	7	?/1		F	0-		f r o m 6(15)
	7	NON-CONS \nname		14	8	?/1		F	0-		f r o m 6(18)
	7	COLIFORM		14	9	1		F	0-		No./10 0ml
	7A	CHL-A		14	10	1		F	0-		ug/l
	7A	ORG-N		14	11	1		F	0-		mg/l
	7A	NH3-N		14	12	1		F	0-		mg/l
	7A	NO2-N		14	13	1		F	0-		mg/l
	7A	NO3-N		14	14	1		F	0-		mg/l
	7A	ORG-P		14	15	1		F	0-		mg/l
	7A	DIS-P		14	16	1		F	0-		mg/l
		*** Array screen, 1(16) determines # of rows									
		*** 'name' is obtained from Screen No. 6 if any									
		Incremental Inflow									
	8	REACH NO.		15	1	?					

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
INCRFLOW	8	FLOW		15	2	1		F			ft ³ /s,m ³ /s
INCRTEMP	8	TEMP		15	3	1		F	35.-135.	70.0	F
									2.-55.0	21.0	C
INCRDO	8	DO		15	4	1		F	0.-15.	0.0	mg/l
INCRBOD	8	BOD		15	5	1		F	0.-1000.	0.0	mg/l
INCRCM1	8	CONS #1\n name		15	6	?/1		F	0-		f r o m 6(11)
INCRCM2	8	CONS #2\n name		15	7	?/1		F	0-		f r o m 6(13)
INCRCM3	8	CONS #3\n name		15	8	?/1		F	0-		f r o m 6(15)
INCRANC	8A	NON-CONS\n name		15	9	?/1		F	0-		f r o m 6(18)
INCRCOLI	8A	COLIFORM		15	10	1		F	0-		No./10 0ml
INCRCHLA	8A	CHL-A		15	11	1		F	0-		ug/l
INCRNH2N	8A	ORG-N		15	12	1		F	0-		mg/l
INCRNH3N	8A	NH3-N		15	13	1		F	0-		mg/l
INCRNO2N	8A	NO2-N		15	14	1		F	0-		mg/l
INCRNO3N	8A	NO3-N		15	15	1		F	0-		mg/l
INCRPORG	8A	ORG-P		15	16	1		F	0-		mg/l
INCRDISP	8A	DIS-P		15	17	1		F	0-		mg/l
		*** Array screen									
		*** 'name' is obtained from Screen No. 6 if any									
		Headwater Source Data									
	10	HEADWATER\n NAME		16	1	?					
HWTRFLOW	10	FLOW		16	2	1		F			ft ³ /s,m ³ /s
HWTRTEMP	10	TEMP		16	3	1		F	35.-135.	70.0	F
									2.-55.0	21.0	C
HWTRDO	10	DO\n(mg/l)		16	4	1		F	0.-15.	0.0	mg/l
HWTRBOD	10	BOD\n(mg/l)		16	5	1		F	0.-1000.	0.0	mg/l

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
HWTR CM1	10	CONS #1\name		16	6	?/1		F			f r o m 6(11)
HWTR CM2	10	CONS #2 \name		16	7	?/1		F			f r o m 6(13)
HWTR CM3	10	CONS #3 \name		16	8	?/1		F			f r o m 6(15)
HWTR ANC	10A	NON-CONS \name		16	9	?/1		F			f r o m 6(18)
HWTR COLI	10A	COLIFORM \n(No./100ml)		16	10	1		F			No./10 0ml
HWTR CHLA	10A	CHAL-A		16	11	1		F			ug/l
HWTR NH2N	10A	ORG-N		16	12	1		F			mg/l
HWTR NH3N	10A	NH3-N		16	13	1		F			mg/l
HWTR NO2N	10A	NO2-N		16	14	1		F			mg/l
HWTR NO3N	10A	NO3-N		16	15	1		F			mg/l
HWTR PORG	10A	ORG-P		16	16	1		F			mg/l
HWTR DISP	10A	DIS-P		16	17	1		F			mg/l
		*** Array screen									
		** total # of point loads & withdrawals determines # of rows									
		*** 'name' is obtained from Screen No. 6 if any									
		Point Loads and Withdrawals									
	11	REACH NO.		17	1	1		F			
		ELE NO.		17	2	1					
		TYPE		17	3	1		C			
		NAME		17	4	1					
PTLD TFCT	11	TREAT \n(%)		17	5	1		F	0.0-1.0	0.0	
PTLD FLOW	11	FLOW		17	6	1		F	-999.- 999	0.0	ft3/s,m 3/s
PTLD TEMP	11	TEMP		17	7	1		F	35.-135.	70.0	F
									2.-55.0	21.0	C
PTLD DO	11	DO		17	8	1		F	0.-15.	0.0	mg/l
PTLD BOD	11	BOD		17	9	1		F	0.-1000.	0.0	mg/l
PTLD CM1	11	CONS #1\name		17	10	?/1		F	0-		f r o m 6(11)

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
PTLD CM2	11	CONS #2 \nname		17	11	?/1		F	0-		f r o m 6(13)
PTLD CM3	11	CONS #3 \nname		17	12	?/1		F	0-		f r o m 6(15)
PLTD ANC	11A	NON-CONS \nname		17	13	?/1		F	0-		f r o m 6(18)
PTLD COLI	11A	COLIFORM		17	14	1		F	0-		No./10 0ml
PTLD CHLA	11A	CHL A		17	15	1		F	0-		ug/l
PTLD NH2N	11A	ORG-N		17	16	1		F	0-		mg/l
PTLD NH3N	11A	NH3-N		17	16	1		F	0-		mg/l
PTLD NO2N	11A	NO2-N		17	17	1		F	0-		mg/l
PTLD NO3N	11A	NO3-N		17	18	1		F	0-		mg/l
PTLD PORG	11A	ORG-P		17	19	1		F	0-		mg/l
PTLD DISP	11A	DIS-P		17	20	1		F	0-		mg/l
		*** Array screen									
		Dam Reaeration									
	12	REACH NO.		18	1	?					
	12	ELE #		18	2	?		I	1-20		
DAMS ACOF	12	ADAM \nCOEFF		18	3	1		F	.5-2.0	1.0	
DAMS BCOF	12	BDAM \nCOEFF		18	4	1		F	.01-1.5	1.0	
DAMS FRAC	12	% FLOW \nOVER DAM		18	5	1		F	0.0-1.0	0.0	
	12	HEIGHT \nDAM		18	6	1		F	0-	0.0	ft,m
		*** 'name' is obtained from Screen No. 6 if any									
		Downstream Boundary									
	13	Temperature		19	1	1		F	35.-135. 2.-55.0	70.0 21.0	F C
	13	Dissolved oxygen (mg/l)		19	2	1		F	0.-15.	0.0	mg/l
	13	BOD concentration (mg/l)		19	3	1		F	0.-1000.	0.0	mg/l
	13	Conservative #1 (name)		19	4	?/1		F	0-		f r o m 6(11)
	13	Conservative #2 (name)		19	5	?/1		F	0-		f r o m 6(13)
	13	Conservative #3 (name)		19	6	?/1		F	0-		f r o m 6(15)

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
				19		5		F	0-		
	13	Non-conservative (name)		19	7	?/1		F	0-		f r o m 6(18)
	13	Coliform (No./100 ml)		19	8	1		F	0-		No./100ml
	13A	Chlorophyll a (ug/l)		19	9	1		F	0-		ug/l
	13A	Organic N as N (mg/l)		19	10	1		F	0-		mg/l
	13A	Ammonia as N (mg/l)		19	11	1		F	0-		mg/l
	13A	Nitrite as N (mg/l)		19	12	1		F	0-		mg/l
	13A	Nitrate as N (mg/l)		19	13	1		F	0-		mg/l
	13A	Organic Phosphorus as P (mg/l)		19	14	1		F	0-		mg/l
	13A	Dissolved Phosphorus (mg/l)		19	15	1		F	0-		mg/l
		*** Array screen, load values from 7(14) if Climatological input file is available									
		*** or create Climatology input file									
		Global Values of Climatology Data									
		MON \n(mm)		20	1	1		I	1-12	1	
		DAY \n(dd)		20	2	1		I	1-31	1	
		YEAR \n(yy)		20	3	1		I	1-99	86	
		HOUR \n(hh)		20	4	1		F	0-23	0	
STAD ATN		SOLAR \n RADIATION		20	5	1		F	0.-550.	0.0	BTU/ft ² -hr
				20					0-150.0	0.0	Langley/hr
		CLOUD		20	6	1		F	0.-1.	0.0	
		DRY TEMP		20	7	1		F	1.-100.	60.	F
									1.0-38.0	15.0	C
		WET TEMP		20	8	1		F	1.-100.	60.	F
									1.0-38.0	15.0	C
		BAROMETRIC \n PRESSURE		20	9	1		F	27.-33.	30.	in Hg
									9 0 0 . - 1100.	1017.0	mbar
		WIND \n SPEED		20	10	1		F	0-100.	0.0	ft/s
									0-36.	0.0	m/s
		Uncertainty Analysis									
		Description of uncertainty analysis		21	1			C80			
		Uncertainty		21	2	5					
		Sensitivity analysis		21	3	6					
		First order error analysis		21	4	6					
		Monte carlo simulation		21	5	6					
		Magnitude of input perturbation (%)		21	6	1					

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
		Number of simulations		21	7	1					
		Input condition		21	8	5					
		Single/Multiple perturbation		21	9	6					
		2-level factorial design		21	10	6					
		All inputs		21	11	6					
		Generic inputs		21	12	6					
		# of input variables		21	13	1					
	1,1A, 1B	Global		21	14	4					
	5,5A	Hydraulic/Climatology		21	15	4					
	6,6A, 6B	Reaction coefficient		21	16	4					
	8,8A	Incremental flow		21	17	4					
	10,10 A	Headwater		21	18	4					
	11,11 A	Point loads		21	19	4					
	12	Dams		21	20	4					
		Input variance data file		21	21	3					
		Intermediate output		21	22	5					
		None		21	23	6					
		Complete		21	24	6					
		Limited		21	25	6					
		Output variables		21		5					
		Hydraulic		21	26	4					
		Quality		21	27	4					
		Internal		21	28	4					
		*** VARIABLE, 24(3), were obtained from appropriate Input code									
		Input Variables for Sensitivity Analysis									
		TYPE		22	1	3					
		Single		22			1				
		Multiple		22			2				
		Fractorial		22			3				
		# OF INPUT		22	2	1		I			
		VARIABLE		22	3	3		C			
		PERTURBATION (%)		22	4	1		F			
		*** Create/Edit Input Variance Data File									
		*** see Table 2 for 25(1-2)									
		Input Variables for First Order and Monte Carlo Analysis			23						

Table A.1 (continued)

Input code	Data Type	Description	QUAL2E VARIABLE	SCR	CS	CT	Item	Type	Range	Default	Units
		GENERIC \n GROUP		23	1	load		C20			
		VARIABLE \n NAME		23	2	load		C30			
		COEFF \n VARIATION		23	3	1		F			
		PROBABILITY \nDF		23	4	3		C15			
		Normal		23			1				
		Log-normal					2				
		Select Element Number to be Printed									
		REACH NO.		24	1						
		E1		24	2	4					
		E2		24	3	4					
		...		24	...						
		E20		24	21	4					

REFERENCE

Brown, L. C., and T. O. Barnwell, Jr. 1987. *The Enhanced Stream Water Quality Models QUAL2E and QUAL2E-UNCAS: Documentation and User Manual*. EPA-600/3-87/007. U.S. Environmental Protection Agency, Athens, GA. May.

Table A.1 (continued)